

WHAT IS CLAIMED IS:

1. A tape reel assembly for use in a tape drive system for winding and unwinding a storage tape, the tape reel assembly comprising:
a hub defining an inner surface and a tape winding surface, at least a portion of the hub being made of plastic;
wherein the tape winding surface has an effective radial modulus of greater than 0.3 million pounds-per-square-inch.
2. The tape reel assembly of claim 1, wherein the hub includes a metal insert that forms at least a portion of the tape winding surface.
3. The tape reel assembly of claim 2, wherein the metal insert is an annular ring of aluminum.
4. The tape reel assembly of claim 3, wherein the annular ring has a thickness in a range of approximately 0.005 inch to approximately 0.250 inch.
5. The tape reel assembly of claim 3, wherein the annular ring has a thickness of approximately 0.050 inch.
6. The tape reel assembly of claim 1, wherein the hub is a glass-filled polymer.
7. The tape reel assembly of claim 6, wherein the hub is 30% glass-filled styrene acrylonitrile.
8. The tape reel assembly of claim 7, wherein the tape reel assembly further includes:
a first reel section defining a first core portion and an upper flange; and

a second reel section defining a second core portion and a lower flange;
wherein upon final assembly, the first core portion and the second core
portion combine to define the hub.

9. The tape reel assembly of claim 1, wherein the hub includes a metal insert that forms at least a portion of the inner surface.
10. The tape reel assembly of claim 9, wherein the metal insert is an annular ring of steel.
11. The tape reel assembly of claim 9, wherein the metal insert is a cup shaped annulus that defines a drive washer and a drive bore.
12. The tape reel assembly of claim 1, wherein the hub includes:
a core of plastic between the inner surface and the tape winding surface; and
a metal insert disposed within the core.
13. The tape reel assembly of claim 12, wherein the metal insert is an annular ring of metal.
14. The tape reel assembly of claim 1, wherein the tape reel assembly further includes:
an upper flange and a lower flange, the upper and lower flanges extending in
a radial fashion from opposing sides of the hub, respectively.
15. A tape reel assembly for use in a tape drive system for winding and
unwinding a storage tape, the tape reel assembly comprising:
a hub defining an inner surface and a tape winding surface, at least a portion
of the hub being made of plastic;

wherein at least a portion of the tape winding surface is metal.

16. The tape reel assembly of claim 15, wherein the tape winding surface has an effective radial modulus of greater than 0.3 million pounds-per-square-inch.

17. The tape reel assembly of claim 15, wherein the tape winding surface has an effective radial modulus of approximately 0.9 million pounds-per-square-inch.

18. The tape reel assembly of claim 15, wherein the metal at the tape winding surface is an annular ring of aluminum.

19. The tape reel assembly of claim 18, wherein the annular ring has a thickness in a range of approximately 0.005 inch to approximately 0.250 inch.

20. The tape reel assembly of claim 18, wherein the annular ring has a thickness of approximately 0.050 inch.

21. The tape reel assembly of claim 15, wherein the tape reel assembly further includes:

an upper flange and a lower flange, the upper and lower flanges extending in a radial fashion from opposing sides of the hub, respectively.

22. A tape reel assembly for use in a tape drive system for winding and unwinding a storage tape, the tape reel assembly comprising:

a hub defining an inner surface and a tape winding surface;
wherein the hub is 30% glass-filled styrene acrylonitrile.

23. The tape reel assembly of claim 22, wherein the tape winding surface has an effective radial modulus of greater than 0.3 million pounds-per-square-inch.

24. The tape reel assembly of claim 22, wherein the tape reel assembly further includes:
- a first reel section defining a first core portion and an upper flange; and
 - a second reel section defining a second core portion and a lower flange;
- wherein upon final assembly, the first core portion and the second core portion combine to define the hub.
25. The tape reel assembly of claim 24, wherein the tape winding surface has an effective radial modulus of approximately 0.5 million pounds-per-square-inch.
26. A tape reel assembly for use in a tape drive system for winding and unwinding a storage tape, the tape reel assembly comprising:
- a hub including a core and a backbone that combine to define an inner surface and a tape winding surface, at least a portion of the hub being made of plastic;
- wherein at least a portion of the inner surface is metal.
27. The tape reel assembly of claim 26, wherein the tape winding surface has an effective radial modulus of greater than 0.3 million pounds-per-square-inch.
28. The tape reel assembly of claim 26, wherein the tape winding surface has an effective radial modulus of approximately 1.0 million pounds-per-square-inch.
29. The tape reel assembly of claim 26, wherein the backbone defines a drive bore separated from the inner surface by a distance of approximately 0.5 inch.
30. The tape reel assembly of claim 26, wherein the backbone is a cup shaped annulus comprised of steel.

31. The tape reel assembly of claim 26, wherein the tape reel assembly further includes:
an upper flange and a lower flange, the upper and lower flanges extending in a radial fashion from opposing sides of the hub, respectively.
32. A tape reel assembly for use in a tape drive system for winding and unwinding a storage tape, the tape reel assembly comprising:
a hub defining an inner surface and a tape winding surface, the hub including:
a plastic core disposed between the inner surface and the tape winding surface; and
a metal annulus disposed within the core.
33. The tape reel assembly of claim 32, wherein the tape winding surface has an effective radial modulus of greater than 0.3 million pounds-per-square-inch.
34. The tape reel assembly of claim 32, wherein the tape winding surface has an effective radial modulus of approximately 0.9 million pounds-per-square-inch.
35. A tape reel assembly for use in a tape drive system for winding and unwinding storage tape, the tape reel assembly comprising:
a hub defining an inner surface and a tape winding surface, at least a portion of the hub being made of plastic; and
means for configuring the tape winding surface to have an effective radial modulus of greater than 0.3 million pounds-per-square-inch.
36. A data storage tape cartridge comprising:
a housing defining an enclosed region;

at least one tape reel assembly rotatably disposed within the enclosed region
and including:

a hub defining an inner surface and a tape winding surface; and

a storage tape wound about the tape winding surface of the hub;

wherein winding of the storage tape onto the hub applies a stress that
deflects the tape winding surface, and further wherein the deflection
of the tape winding surface resulting from the applied stress
corresponds to an effective radial modulus of the tape winding
surface of greater than 0.3 million pounds-per-square-inch.